

REMARKS

Claims 13-27 were examined. Claims 13-14 and 16-26 were rejected under 35 U.S.C. 102 and claims 15 and 27 are rejected on the basis of 35 U.S.C. 103.

REJECTION UNDER 35 U.S.C. § 102

Claims 13-14 and 16-26 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Skeen et al. (U.S. Pat. No. 5,187,787). This rejection is respectfully traversed.

Claim 13 has been amended by incorporating features of claims 14, 16 and 18.

It is respectfully submitted that claim 13 as amended is not anticipated by Skeen for at least the reasons described immediately below.

An important difference between the subject matter of original claim 13 and Skeen et al. is that the electronic apparatus according to original claim 13 is forming one of a sensor, an actuator and a control (which communicate using a common field bus protocol) whereas Skeen et al. describe the communication between applications running on different or the same computer. Sensors, actuators and controls coupled over a field bus on the one hand and computers coupled for example to an Ethernet local area network are completely different and are used in different technical fields. Therefore, Skeen et al. is considered not to be relevant to original claim 13 and claim 13 as amended here. Skeen et al. does not show or suggest using a sensor, an actuator and a control as described in original and amended claim 13 of the present application.

Original claim 14 features are now included in claim 13. Thus, claim 13 now describes that the control engine includes a plurality of bus protocol-specific engines

and a plurality of bus protocols, each of the bus protocol-specific engines being associated with a bus protocol and wherein each bus protocol-specific engine converts application-specific data into the associated bus protocol and converts data received via the bus interface in the associated bus protocol into application-specific data. That means, in order to be able to connect the electronic apparatus to a plurality of different bus systems using different bus protocols there are provided a plurality of corresponding bus protocol-specific engines in the control engine. Each of the bus protocol-specific engines is associated with a bus-protocol and is capable to convert application-specific data into the associated bus protocol and vice versa.

According to original claim 16, at least some of the bus protocol-specific engines are associated with a single bus interface and a selection unit is provided from the selection of the respective bus protocol-specific engine to be used. As described in paragraph [0019] of the specification, this embodiment can be used when different bus systems can be connected to the electronic apparatus in accordance with the invention via uniform physical interfaces. Although the same physical interface is used different bus protocols may be usable and with providing a plurality of bus protocol-specific engines and a selection unit selection of the presently used bus protocol is possible. This feature is now in claim 13 as amended and distinguishes from Skeen.

In addition, original claim 18 describes that the bus protocol-specific engine is automatically selected using the selection unit based on a currently implemented bus protocol. This means that completely independently of the presently used bus protocol, the electronic apparatus of the invention can be connected with the bus system and through the selection unit the presently used bus protocol is automatically detected and

the corresponding protocol-specific engine is automatically selected from the plurality of provided bus protocol-specific engines. This feature is now in claim 13 as amended and distinguishes from Skeen.

The Office Action states that the subject matter of claim 14 is already known from Skeen et al., Fig. 16 and Fig. 8. This is, however, not true since Fig. 8 is only related to a selection of a specific format conversion table for converting data if two computers which communicate with each other are using different data formats. For example, in column 14, lines 29 to 31 it is described that a format conversion table can be used for converting from DEC machines to X409 format.

Skeen has nothing to do with the present invention which provides a plurality of bus protocol-specific engines and a selection unit which can automatically detect the currently implemented bus protocol and automatically select the bus protocol-specific engine corresponding to the currently implemented bus protocol.

Also Skeen's Fig. 16 does not disclose the above inventive feature since Skeen's Figs. 15 and 16 are related to an embodiment of Skeen et al. in which the client applications 16 and 18 are both running on the same host processor (see column 21, lines 43 to 45). This is totally different from the present invention, because the present invention provides a plurality of bus protocol-specific engines within each of different electronic apparatus in order to ensure that different electronic apparatus can communicate over a plurality of different bus systems using different bus protocols.

With respect to previous claims 16 and 18, the Examiner stated that the features of these claims are features which are inherent to the teachings of Skeen et al. This is, however, not true since Skeen et al. is silent about an electronic apparatus having a

control engine including a plurality of bus protocol-specific engines which are associated with a single bus interface as well as a selection unit for automatically selecting the bus protocol-specific engine based on a currently implemented bus protocol.

It is, therefore, respectfully submitted that the combination of the features of original claims 13, 14, 16 and 18 in amended claim 13 renders claim 13 novel and patentable for any one of the reasons given above.

Present claim 21 describes a configuration apparatus for configuring an electronic apparatus having features as in original claim 13.

It is important to note that the configuration apparatus has the same structure as the electronic apparatus. Accordingly, within the configuration apparatus, the same separation of the application from the communication logic takes place. In this case the application is adapted to control the configuration of a connected electronic apparatus (sensor, actuator or control), and it is important that the bus protocol-specific engine exchanges application-specific data with the application-specific engine (of the configuration apparatus) via a standardized interface that is common to a standardized interface of the electronic apparatus which is to be configured.

As described in paragraph [0016] of the specification, in this way it is possible to address device parameters of the devices to be configured independently of the respective field bus implementation so that the connection to configuration and diagnostic software is simplified. By using the same standardized interface in the configuration apparatus as in the electronic apparatus to be configured, it is ensured that the apparatus to be configured and the configuration apparatus each have the same internal field bus-independent address.

In order to more clearly define that the configuration apparatus is for configuring another electronic apparatus using the same internal standardized interface, the features of original claim 22 are now included in amended claim 21. Thus, amended claim 21 explicitly states that the configuration apparatus reads out and sets application-specific predetermined settings of the electronic apparatus that is to be configured.

Based on page 4 of the Office Action, it seems that the Examiner has interpreted original claim 22 to say that configuration settings from the computer itself are read and set by the CPU of the computer. However, this is not the apparatus as defined in claim 21 as amended.

Skeen is contrary to the present feature that the configuration apparatus and the electronic apparatus to be configured should use the same internal standardized interface between each of the application-specific engine and the protocol-specific engine.

Skeen et al. describes the purpose of the communications interface module 20, namely, to decouple application 16 from the details of the data format and organization of data in forms used by application 18 (see column 7, lines 44 to 46).

Skeen is contrary to the mentioned feature of amended claim 21 of the present application requiring that a common standardized interface within the configuration apparatus on the one hand, and the electronic apparatus to be configured on the other hand, must be used.

Therefore, Skeen et al. is devoid of any teaching relative to the apparatus of claim 21 as amended.

Claims 15, 17, 19 and 20 depend on amended claim 13 and claims 23 and 24 depend on amended claim 21. Claims 15, 17, 19, 20, 23 and 24 are respectfully submitted to be patentable for the reasons given with respect to claims 13 and 21 from which they depend.

Claim 25 defines a data bus; and

a plurality of electronic apparatuses each of which is one of a sensor, an actuator and a control that communicates with at least one additional electronic apparatus via a data bus using a pre-determined communications protocol and each of which comprises:

a bus interface;

a control engine; and

a bus protocol-specific engine.

Skeen does not teach a plurality of electronic apparatuses being of the type defined and in combination with the other elements of claim 25.

Claim 26 depends on claim 25 and is patentable over Skeen for the reasons given as to claim 25.

REJECTION UNDER 35 U.S.C. § 103

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Skeen et al., as applied to claim 14 rejection, in view of Kimura et al. (U.S. Pat. No. 5,778,189). This rejection is respectfully traversed.

Claim 15 now depends on amended claim 13. Kimura does not supply the deficiencies of Skeen as to the novel features of claim 13 as amended. Thus, claim 15 is patentable over Skeen and Kimura at least for the reasons given as to claim 13.

Claim 27 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Skeen et al., as applied to claim 24 rejection, in view of Brody et al. (U.S. Pat. No. 6,278,697). This rejection is respectfully traversed.

Claim 27 depends on claim 24 which depends on claim 23 which itself depends on claim 21. Claim 21 has been amended to include the features of original claim 22.

Brody does not supply the deficiencies of Sheen as to the novel features of claim 21 as amended. Thus, claim 27 is patentable over Skeen and Brody at least for the reasons given as to claim 21.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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